

THAT WHICH IS CLAIMED IS:

1. Method for the adhesion of a first element, at least one portion of the surface of which is covered with silicon, to a second element, at least one portion of the surface of which is covered with nickel, comprising an adhesion step carried out by NiSi bonding at a heating temperature above 250°C, the roughness between the two surface portions of the two elements being less than 1 μm .

2. Method according to Claim 1, characterized in that each of the two elements forms part of an integrated circuit of a microsystem.

3. Method according to Claim 1 or 2, characterized in that the minimum bonding time is at least 5 minutes.

4. Method according to one of Claims 1 to 3, characterized in that the heating temperature is between 250°C and 400°C, preferably 300°C.

5. Method according to Claims 3 and 4, characterized in that the minimum bonding time is at least 20 minutes, for example 25 minutes.

6. Method according to one of the preceding claims, characterized in that the layer formed from NiSi has a thickness of the order of 1 μm .

7. Method according to one of the preceding claims, characterized in that the second element includes, beneath the nickel layer, a silicon underlayer.

8. Method according to one of Claims 1 to 6, characterized in that the first element includes, beneath the silicon layer, a nickel underlayer.

9. Method according to any one of Claims 1 to 6, in which:

- the first element is a silicon cover;
and
- the second element includes a resonator supported by a Bragg mirror having a nickel layer between two layers of low acoustic impedance material, characterized in that this method comprises the following steps prior to the adhesion step:
 - a step of preparing the second element, comprising the removal of at least a portion of the layer of low acoustic impedance material so as to expose the nickel layer;
 - a step of preparing the first element, comprising the formation of at least a silicon linking portion; and
 - a step of bringing the linking portion of the first element into contact with the exposed portion of the nickel layer of the second element;
so as to obtain, after adhesion, the resonator encapsulated by the cover.

10. Method according to any one of Claims 1 to 6, in which:

- the first element is a silicon cover;

and

- the second element includes a resonator supported by a Bragg mirror comprising a layer of high acoustic impedance material different from nickel between two layers of low acoustic impedance material, characterized in that this method comprises the following steps prior to the adhesion step:

- a step of preparing the second element, comprising the removal of at least a portion of the layer of low impedance material so as to expose the layer of high impedance material;

- a step of forming nickel on the exposed portion;

- a step of preparing the first element, comprising the formation of at least a silicon linking portion; and

- a step of bringing the linking portion of the first element into contact with the nickel layer formed on the second element;

so as to obtain, after adhesion, the resonator encapsulated by the cover.

11. Integrated circuit, characterized in that it comprises at least two elements mutually fastened by a bond formed from an NiSi alloy.

12. Integrated circuit according to Claim 11, characterized in that the two elements are made of silicon.

13. Integrated circuit according to Claim 11, characterized in that the two elements are made of nickel.

14. Integrated circuit according to Claim 11, characterized in that the first element is a silicon cover and the second element is a resonator supported by a Bragg mirror, the layer of high impedance material of which is nickel, the NiSi bond being located at the interface between a region of the cover and a portion of the nickel layer, the resonator being encapsulated by the cover.

15. Integrated circuit according to Claim 11, characterized in that the first element is a silicon cover and the second element is a resonator supported by a Bragg mirror, the layer of high impedance material of which is different from nickel, the NiSi bond being located at the interface between a region of the cover and a portion of the layer of high impedance material, the resonator being encapsulated by the cover.